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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,188

07/03/2006

Akira Matsuo

MATS3041/GAL

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BACON & THOMAS, PLLC

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EXAMINER

DAVIS, MARY ALICE

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3748

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/585,188	<b>Applicant(s)</b> MATSUO ET AL.	
	<b>Examiner</b> MARY A. DAVIS	<b>Art Unit</b> 3748	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6-13 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/3/06</u> .  | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### *Drawings*

The drawings are objected to under 37 CFR 1.83(a) because they fail to show 42a, 42b, 43a, and 43b (Page 12, last paragraph) as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

Figures 6 and 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

The drawings are objected to because Page 1 is not a drawing, but appears to be a legend. It is unclear on if the Figure 5 legend is part of the drawing or the specification (see below for the Figure 5 that the Examiner is referring to).

~ 1 **UAP20Rc**

FIG. 5

A: OPEN CROSS-SECTIONAL AREA

B: ROTATIONAL ANGLE OF GEAR

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

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and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

***Claims 6-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.***

Claims 6-13 recite limitations to: "a discharge port" (claim 6, lines 12 and 13) and "a notch" (claim 6, lines 17 and 20). Currently these elements are double inclusion, since it is unclear on if the applicant is introducing new elements or if the applicant is trying to further limit these elements. Since "a discharge port" and "a notch" is related to the area that it is formed, the Examiner recommends changing "a discharge port" to - - a pump body discharge port - - and - - a pump cover discharge port - -, as well as, changing "a notch" to - - a pump body notch - - and - - a pump cover notch - -, in order to distinguish between which discharge port and notch the applicant is referring too.

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Furthermore, these terminologies should be used through-out the claim set in order to clearly define which discharge port and which notch is being referred to.

Claim 6 recites the limitation directed to: “wherein the length of the notch formed in the pump body or the pump cover formed of the light alloy is longer than that of the notch formed in the pump body or the pump cover comprising the cast iron; and bubbles generated within the oil in the working spaces during high-speed rotation of the drive gear are reduced by the high-pressure working oil flowing back into the working spaces through the longer notch in the pump body or the pump cover formed of cast iron.”

Claim 6's limitation contradicts itself. One limitation states that “the length of the notch formed in the pump body or the pump cover formed of the light alloy is longer than that of the notch formed in the pump body or the pump cover comprising the cast iron”, which contradicts the last limitation directed to “through the longer notch in the pump body or the pump cover formed of cast iron”. Is the longer notch in the cast iron or in the light alloy?

Claims 7-13 are rejected by virtue of their dependence on claim 6.

***Claim Rejections - 35 USC § 102/ 35 USC § 103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***Claims 6 and 7 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over MAENO (Japanese Patent Publication JP 2003-161269), as currently understood by the Examiner.***

Regarding claim 6, MAENO discloses:

An oil pump comprising:

a pump body (8) having a hollow recess in a side face thereof (see Figures 1a and 7a);

a pump cover (9) having an inner side face closing the hollow recess in the pump body thereby forming a gear compartment (11) (see Figures 1a and 7a; Page 2, ¶0005);

a drive gear (3) driven by a drive shaft (near (12)) and rotatably supported in the gear compartment (see Figures 1a and 7a; Page 3, ¶0010);

a rotatable driven gear (4) rotatably supported in the gear compartment in mesh with the drive gear and driven by the drive gear (see Figures 1a and 7a; Page 2, ¶0005 and Page 3, ¶0010);

a discharge port (6a) formed in the pump body (see Figure 2) and a discharge port (6d) formed in the pump cover (see Figure 3), the discharge ports defining, within the gear compartment, a discharge area for working spaces formed by the engagement of teeth of the drive gear with teeth of the driven gear (see Figures 5-6);

a notch (6c) formed in the pump body and extending circumferentially from the front end of the discharge port to the rear end of the discharge area (see Figures 5-6; Page 8, ¶¶0043- ¶0048); and

a notch (6f) formed in the pump cover and extending from the front end of the discharge port to the rear end of the discharge area (see Figures 5-6);

wherein one of the pump body and the pump cover is formed of cast iron (Page 8, ¶0042) and the other is formed of a light alloy (Page 8, ¶0042);

wherein the length of the notch formed in the pump body or the pump cover formed of the cast iron is longer than that of the notch formed in the pump body or the pump cover comprising the light alloy (the length of the notch in the pump body that is made of cast iron is disclosed to be longer than the length of the notch formed in the cover (6f) that is made of a light alloy (i.e. aluminum), Page 8, ¶¶0046-0048); and

bubbles generated within the oil in the working spaces during high-speed rotation of the drive gear are reduced by the high-pressure working oil flowing back into the working spaces through the longer notch in the pump body or the pump cover formed of cast iron (Page 9, ¶¶0051-¶0054, which discloses that the bubbles flow back thru the longer notch formed in the pump body that is made of cast iron).

Regarding claim 7, MAENO discloses:

the driven gear is a rotatable internal gear having its outer circumference supported by the inner circumferential surface of the gear compartment (see Figures 1a and 7a; and Page 2, ¶0005); the drive gear is an external gear meshing with the driven gear (see Figures 1a and 7a; and Page 2, ¶0005);

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the discharge port in the pump body and the discharge port in the pump cover are each arc-shaped (see Figures 1b, 2a, 3a, 7b, and 8a); and

the notch in the pump body and the notch in the pump cover extend circumferentially from the front ends of the discharge port in the pump body and the discharge port in the pump cover (see Figures 1b, 2a, 3a, 6, 7b, and 8a), respectively, to the rear end of the discharge area (see Figures 1b, 2a, 3a, 6, 7b, and 8a).

The claim limitations in claim 6 contradict each other (see discussion in 112 2<sup>nd</sup> paragraph above). MAENO discloses the longer notch is located in the pump body that is made of cast iron, which meets the claim limitation of "bubbles generated within the oil in the working spaces during high-speed rotation of the drive gear are reduced by the high-pressure working oil flowing back into the working spaces through the longer notch in the pump body or the pump cover formed of cast iron".

However, in the event that the claim 6 limitation is changed to have a consistent limitation directed to "the length of the notch formed in the pump body or the pump cover formed of the light alloy is longer than that of the notch formed in the pump body or the pump cover comprising the cast iron", it would be obvious.

MAENO teaches that the pump is improved by controlling the location of where cavitations occurs so that the cavitations occurs in the part that has a higher erosion resistant material (i.e. cast iron), in order to reduce weight of the part by allowing the other part (i.e. the pup cover) to be made of a low erosion resistant material (i.e. light alloy such as aluminum) (see Page 11, ¶0066- ¶0067).



It would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have the length of the notch formed in the pump body or the pump cover formed of the light alloy is longer than that of the notch formed in the pump body or the pump cover comprising the cast iron in the pump of MAENO, in order to reduce erosion from cavitations at high revolutions. It requires only routine skill in the art to determine where erosion is occurring in a pump, and modify the type of material used in order to increase the erosion resistance of the part, as taught by MAENO. The applicant's invention is switching the location of the long notch to be in the low erosion material due to higher rotational speeds results in cavitations occurring at the shorter notch location. MAENO teaches that the higher erosion resistant material is placed where cavitations and erosion are occurring (see Page 11, ¶¶0066- ¶¶0067), and that the notches aid in controlling the flow (Page 8, ¶¶0043). It is the Examiner's position that MAENO teaches notches to control flow and locating a higher erosion resistant material where cavitations occur, and that, it would require only routine skill in the art to determine the appropriate notch and high erosion resistant material (i.e. cast iron) depending on the pump's design. Furthermore, MAENO teaches utilizing cast iron and a light alloy (aluminum) in order to reduce weight where the cast iron is utilized in the high erosion location where cavitations occur, and controlling the location of cavitations with the aid of notches in both the pump body and pump cover.

***Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over MAENO in view of either one of WATANABE (U.S. Patent 6,544,021 B2), and JOSA (Japanese Patent Publication JP 01-273887).***

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MAENO discloses the claimed invention, as discussed above, however, fails to disclose the notch formed in the pump body or the pump cover formed of the light alloy has an approximately triangular shape and a width decreasing from the front end of the discharge port toward the rear end of the discharge area.

Regarding claims 8 and 11, WATANABE teaches:

the notch (223a, b, c) formed in the pump body or the pump cover formed of the light alloy has an approximately triangular shape (see Figure 8) and a width decreasing from the front end of the discharge port toward the rear end of the discharge area (see Figure 8).

Regarding claims 8 and 11, JOSA teaches:

the notch (22a) formed in the pump body or the pump cover formed of the light alloy has an approximately triangular shape (see Figure 6) and a width decreasing from the front end of the discharge port toward the rear end of the discharge area (see Figure 6).

It would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have the notch formed in the pump body or the pump cover formed of the light alloy has an approximately triangular shape and a width decreasing from the front end of the discharge port toward the rear end of the discharge area in the pump of MAENO, in order to restrain noise, vibration, and wear in the pump. Furthermore, it would require only routine skill in the art to utilize known notches in the discharge passages, as taught by either one of WATANABE and JOSA, which would produce predictable results. The location of the notch being on the light alloy or the cast

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iron would require only routine skill in the art, as taught by MAENO, where the part that would encounter higher erosion / more cavitations would utilize the higher erosion material (i.e. cast iron) and the other part (i.e. either the pump body or the cover) would comprise of the lower erosion material that is light weight (i.e. the light alloy such as aluminum).

***Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified pump of MAENO as applied to claim 8 above, and further in view of either one of SATOMOTO (U.S. Patent 4,767,296) and SUZUKI (Japanese Patent Publication JP 04-5476). Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over MAENO in view of either one of SATOMOTO and SUZUKI.***

MAENO or the modified pump of MAENO discloses the claimed invention, as discussed above, however, fails to disclose the notch formed in the pump body or the pump cover formed of the light alloy has an inclined bottom so that its depth decreases from the front end of the discharge port toward the rear end of the discharge area.

Regarding claims 9, 12, and 13, SATOMOTO teaches:

the notch (23) formed in the pump body or the pump cover formed of the light alloy has an inclined bottom so that its depth decreases from the front end of the discharge port toward the rear end of the discharge area (see Figure 6).

Regarding claims 9, 12, and 13, SUZUKI teaches:

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the notch (19) formed in the pump body or the pump cover formed of the light alloy has an inclined bottom so that its depth decreases from the front end of the discharge port toward the rear end of the discharge area (see Figure 10).

It would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have the notch formed in the pump body or the pump cover formed of the light alloy has an inclined bottom so that its depth decreases from the front end of the discharge port toward the rear end of the discharge area in the pump or modified pump of MAENO, in order to prevent generation of cavitations. Furthermore, it would require only routine skill in the art to utilize known notches in the discharge passages, as taught by either one of SATOMOTO and SUZUKI, which would produce predictable results. The location of the notch being on the light alloy or the cast iron would require only routine skill in the art, as taught by MAENO, where the part that would encounter higher erosion / more cavitations would utilize the higher erosion material (i.e. cast iron) and the other part (i.e. either the pump body or the cover) would comprise of the lower erosion material that is light weight (i.e. the light alloy such as aluminum).

***Claim 10 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over MAENO in view of HAYABUCHI (Japanese Patent Publication JP 11-082644).***

Regarding claim 10, MAENO discloses:

An automatic transmission having a supply source of hydraulic pressure, wherein the supply source of the hydraulic pressure is the oil pump according to Claim 6;

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and the pump body or the pump cover formed of the light alloy is integrated with a housing of the automatic transmission (see Figures 1 and 7; Page 2, ¶0001- ¶0003, Page 13, ¶0084- ¶0086, Page 15, Drawing 1 and Drawing 7 descriptions).

MAENO discloses the pump body or the pump body as part of the automatic transmission; however, MAENO does not specifically disclose the pump body or the pump cover formed of the light alloy is integrated with a housing of the automatic transmission. MAENO references HAYABUCHI (Japanese Patent Publication JP 11-082644) that teaches disclose the pump body or the pump cover formed of the light alloy is integrated with a housing of the automatic transmission (see Figure 4, and Abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the pump body or the pump cover formed of the light alloy is integrated with a housing of the automatic transmission in the automatic transmission of MAENO, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Furthermore, the automatic transmission comprising of a light alloy, such as aluminum, is well known in the art.

### ***Communication***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARY A. DAVIS whose telephone number is (571)272-

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9965. The examiner can normally be reached on Monday thru Thursday; 5:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas E. Denion/  
Supervisory Patent Examiner, Art Unit 3748

/Mary A Davis/  
Examiner, Art Unit 3748